## Instructions

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General information about preregistration is available at <https://cos.io/prereg> and you can reach out to [prereg@cos.io](mailto:prereg@cos.io). A preprint of this template is available at <https://osf.io/preprints/metaarxiv/epgjd/>

This document includes the questions that will be when completing this registration template on OSF. Make a copy of this document and use it to plan and prepare for submitting your registration.

Questions with a red asterisk (\*) are required.

Questions will offer one of the following input options:

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|  | Radio button | You will be provided with a series of options and may select only one. |
|  | Check box | You will be provided with a series of options and may select as many as necessary. |
| Text box | Text box  (short or long) | You will type in your response. |
|  | File upload widget | You can upload a file as a response to this question. You may attach up to 5 files and cannot total over 5GB in size. |

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# Metadata

### Title\*

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| Simultaneous opposite aftereffects in vocal emotion adaptation (Experiments 2 and 3) |

### Description\*

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| Previous research has shown stable perceptual aftereffects following vocal emotion adaptation: after prolonged exposure to angry voices (adaptors), an ambiguous target voice lying on an angry-fearful continuum will be more likely perceived as fearful. However, after prolonged exposure to fearful voices, the same ambiguous target voices will be more likely perceived as angry (cf. Bestelmeyer et al., 2010a, Nussbaum et al., 2022). These adaptation aftereffects provide evidence for our perceptual systems’ flexibility, by calibrating on current stimulation and thereby shifting the sensitivity range in order to be more responsive to relevant changes.  Intriguingly, research in the visual domain has shown that emotional adaptation, i.e. the “recalibration of the system” can be a multidimensional process, as it is possible to create simultaneous opposite aftereffects (Bestelmeyer et al. 2010b): participants adapted to angry-female faces and fearful-male faces (and vice versa) at the same time and then showed sex-specific aftereffects, i.e. female target faces were more often classified as fearful and male target faces more often classified as angry (and vice versa).  In our first Experiment 1 (not pre-registered), we replicated this finding for the vocal domain, using fearful and angry pseudowords of male and female speakers. Thus, we found evidence that the “recalibration to vocal emotions”, as indexed by perceptual adaptation, is to some degree sex-specific.  In two follow-up experiments, we now want to further explore the multidimensionality and flexibility of vocal emotion adaptation. In Experiment 1, vocal emotion adaptation was tied to speaker sex. Now, we want to test if simultaneous opposite aftereffects can also be elicited when vocal emotion adaptation is tied to speaker identity (Experiment 2) and pseudoword (Experiment 3). |

### Contributors\*

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| --- |
| Christine Nussbaum, Stefan R. Schweinberger |

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### Subject\*

Our system uses the [bepress taxonomy](https://bepress.com/wp-content/uploads/2016/12/bepress_Disciplines_taxonomy.pdf). Please select as many subjects as you please. Note, the more detailed and inclusive you are in your response makes it easier for others to find your work.

### Tags

# Study Information

### Hypotheses\*

List specific, concise, and testable hypotheses. Please state if the hypotheses are directional or non-directional. If directional, state the direction. A predicted effect is also appropriate here. If a specific interaction or moderation is important to your research, you can list that as a separate hypothesis.

**Example**: If taste affects preference, then mean preference indices will be higher with higher concentrations of sugar.

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| For **Experiment 2** (identity), we expect to find simultaneous opposite aftereffects, indicated by a AdaptationBlock x Identity interaction:  Adaptation Block 1 (female voices):  Angry-Identity 1 | Fearful-Identity 2 (adaptors) ---> target voices of Identity 1 are more often classified as fearful and target voices of Identity 2 more often as angry.  Adaptation Block 2 (female voices):  Angry-Identity 2 | Fearful-Identity 1 (adaptors) ---> target voices of Identity 2 are more often classified as fearful and target voices of Identity 1 more often as angry.  Angry-Identity 3 | Fearful-Identity 4 (adaptors) ---> target voices of Identity 3 are more often classified as fearful and target voices of Identity 4 more often as angry.  Adaptation Block 2 (female voices):  Angry-Identity 4 | Fearful-Identity 3 (adaptors) ---> target voices of Identity 4 are more often classified as fearful and target voices of Identity 3 more often as angry.  For **Experiment 3** (pseudoword), we expect NO simultaneous opposite aftereffects, thus no AdaptationBlock x pseudoword interaction:  Adaptation Block 1:  Angry-Pseudowords 1,3 | Fearful-Pseudowords 2,4 (adaptors) ---> target voices of all pseudowords (1,2,3,4) have are similarly likelihood to be classified as either angry or fearful, because adaptation impressions cancel each other out across pseudowords.  Adaptation Block 2 :  Angry-Pseudowords 2,4 | Fearful-Pseudowords 1,3 (adaptors) ---> target voices of all pseudowords (1,2,3,4) have are similarly likelihood to be classified as either angry or fearful, because adaptation impressions cancel each other out across pseudowords.  This will be found for both male and female voices.  Shifts in classification responses will be quantified via the point of subjective equality (PSE) of the response curves to the target stimuli. Thus, the PSE is the primary outcome variable. |

# Design Plan

In this section, you will be asked to describe the overall design of your study. Remember that this research plan is designed to register a single study, so if you have multiple experimental designs, please complete a separate preregistration.

### Study type\*

Please select one of the following statements.

* **Experiment - A researcher randomly assigns treatments to study subjects, this includes field or lab experiments. This is also known as an intervention experiment and includes randomized controlled trials.**
* Observational Study - Data is collected from study subjects that are not randomly assigned to a treatment. This includes surveys, “natural experiments,” and regression discontinuity designs.
* Meta-Analysis - A systematic review of published studies.
* Other

### Blinding\*

Blinding describes who is aware of the experimental manipulations within a study. Mark all that apply.

* **No blinding is involved in this study.**
* For studies that involve human subjects, they will not know the treatment group to which they have been assigned.
* Personnel who interact directly with the study subjects (either human or non-human subjects) will not be aware of the assigned treatments. (Commonly known as “double blind”)
* Personnel who analyze the data collected from the study are not aware of the treatment applied to any given group.

### Is there any additional blinding in this study?

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| No. |

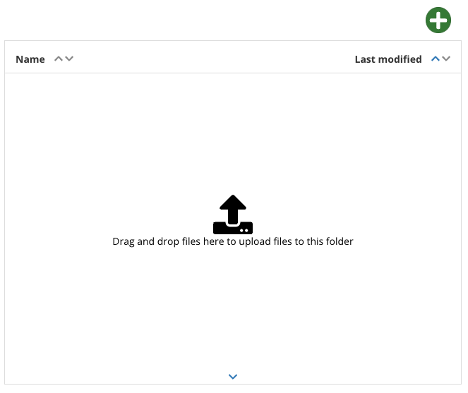
### Study design\*

Describe your study design. The key is to be as detailed as is necessary given the specific parameters of the design. There may be some overlap between this question and the following questions. That is OK, as long as sufficient detail is given in one of the areas to provide all of the requested information. Examples include two-group, factorial, randomized block, and repeated measures. Is it a between (unpaired), within-subject (paired), or mixed design? Describe any counterbalancing required.

**Example**: We have a between subjects design with 1 factor (sugar by mass) with 4 levels.

**More info**: This question has a variety of possible answers. The key is for a researcher to be as detailed as is necessary given the specifics of their design. Be careful to determine if every parameter has been specified in the description of the study design. There may be some overlap between this question and the following questions. That is OK, as long as sufficient detail is given in one of the areas to provide all of the requested information. For example, if the study design describes a complete factorial, 2 X 3 design and the treatments and levels are specified previously, you do not have to repeat that information.

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| Stimulus material:  We use the stimulus material similar to Nussbaum et al. (2022). It comprises of four pseudowords (/molen/, /namil/, /loman/, /belam/), spoken by 4 speakers (2 male, 2 female) in a fearful and angry emotion. These were used to create morphing trajectories between the fearful and angry expression for each speaker and pseudoword. As adaptors, we use the endpoints of these continua (0% = original fearful expression, 100% = original angry expression). This resulted in 4 (speakers) x 4 (pseudowords) x 2 (emotions) = 32 adaptor stimuli. As targets, we use intermediate voice morphs on the continua in 7 equidistant 10% steps from 20%-80%, i.e. 20%, 30%, 40%, 50%, 50%, 70, 80%. This resulted in 4 (speakers) x 4 (pseudowords) x 7 (morph level) = 112 target stimuli.  Design **Experiment 1**:  All participants will first do a Baseline- (2 Blocks) and then an Adaptation-Task (4 Blocks).  In the Baseline-Task, participants will classify all target voices once as fearful or angry without prior adaptation. Presentation of stimuli is blocked by speaker sex, because adaptation will later also be blocked by speaker sex. Each block has 56 trials, resulting in a total of 112 trials. Each trial starts with the presentation of a green fixation cross and after 300ms the voice is played. After voice offset, the fixation cross changes into a green question mark and participants enter their response via the keys f (= fearful) and j (= angry). If they don’t enter a response within 3000 ms after voice offset, a feedback prompting for faster responses is shown on the screen. After 500ms the next trial starts.  The Adaptation-Task consists of four blocks. Each of these blocks is comprised of an adaptation phase and a response phase. In the adaptation phase, 8 different adaptor stimuli (2 identities x 4 pseudowords) are presented twice, resulting in a total of 16 adaptation trials. Voices are played one after another with a interstimulus interval of 600ms, while a red fixation cross is displayed on the screen. After the adaptation phase, the response phase starts. In this phase, participants have to classify the target voices as angry or fearful again. Thus, it is very similar to the Baseline task, with one exception: every fourth trial, the responses are interrupted and two top-up adaptors (one identity each) are played to refresh the adaptation impression. This is signaled by a red fixation cross. After the top-up adaptation, the response phase continues. In total, each response block consists of 56 trials.  Before both baseline and adaptation, participants perform a few practice trials.  Participants are randomly assigned to four possible orders of blocks. They either start with the two female blocks, or the two male blocks. Within these, they either start with adaptation condition 1 or 2. Those who start with female adaptation first, will also start with female voices in the baseline block (and vice versa).  Design Experiment 2:  The Design of Experiment 2 is identical to Experiment 1. The only difference lies in the stimuli that are presented in the adaptation blocks (angry and fearful are linked to the pseudoword) and the top-up adaptors (the two stimuli are from the same identity but different pseudoword) during the response phase. |



### Randomization

If you are doing a randomized study, state how you will randomize, and at what level. Typical randomization techniques include: simple, block, stratified, and adaptive covariate randomization. If randomization is required for the study, the method should be specified here, not simply the source of random numbers.

**Example**: We will use block randomization, where each participant will be randomly assigned to one of the four equally sized, predetermined blocks. The random number list used to create these four blocks will be created using the web applications available at http://random.org.

**More info**: Typical randomization techniques include: simple, block, stratified, and adaptive covariate randomization. If randomization is required for the study, the method should be specified here, not simply the source of random numbers.

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| Participants are randomly assigned to four possible orders of blocks. They vary in the order of the adaptation blocks (see Design). |

# Sampling Plan

In this section we’ll ask you to describe how you plan to collect samples, as well as the number of samples you plan to collect and your rationale for this decision. Please keep in mind that the data described in this section should be the actual data used for analysis, so if you are using a subset of a larger dataset, please describe the subset that will actually be used in your study.

### Existing data\*

Preregistration is designed to make clear the distinction between confirmatory tests, specified prior to seeing the data, and exploratory analyses conducted after observing the data. Therefore, creating a research plan in which existing data will be used presents unique challenges. Please select the description that best describes your situation. See https://cos.io/prereg for more information.

* Registration prior to creation of data: As of the date of submission of this research plan for preregistration, the data have not yet been collected, created, or realized.
* Registration prior to any human observation of the data: As of the date of submission, the data exist but have not yet been quantified, constructed, observed, or reported by anyone - including individuals that are not associated with the proposed study. Examples include museum specimens that have not been measured and data that have been collected by non-human collectors and are inaccessible.
* Registration prior to accessing the data: As of the date of submission, the data exist, but have not been accessed by you or your collaborators. Commonly, this includes data that has been collected by another researcher or institution.
* Registration prior to analysis of the data: As of the date of submission, the data exist and you have accessed it, though no analysis has been conducted related to the research plan (including calculation of summary statistics). A common situation for this scenario when a large dataset exists that is used for many different studies over time, or when a data set is randomly split into a sample for exploratory analyses, and the other section of data is reserved for later confirmatory data analysis.
* Registration following analysis of the data: As of the date of submission, you have accessed and analyzed some of the data relevant to the research plan. This includes preliminary analysis of variables, calculation of descriptive statistics, and observation of data distributions. Please see cos.io/prereg for more information.

### Explanation of existing data

If you indicate that you will be using some data that already exist in this study, please describe the steps you have taken to assure that you are unaware of any patterns or summary statistics in the data. This may include an explanation of how access to the data has been limited, who has observed the data, or how you have avoided observing any analysis of the specific data you will use in your study.

**Example**: An appropriate instance of using existing data would be collecting a sample size much larger than is required for the study, using a small portion of it to conduct exploratory analysis, and then registering one particular analysis that showed promising results. After registration, conduct the specified analysis on that part of the dataset that had not been investigated by the researcher up to that point.

**More info**: An appropriate instance of using existing data would be collecting a sample size much larger than is required for the study, using a small portion of it to conduct exploratory analysis, and then registering one particular analysis that showed promising results. After registration, conduct the specified analysis on that part of the dataset that had not been investigated by the researcher up to that point.

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| Prior to the two registered studies here, we conducted Experiment 1 in which we found evidence for simultaneous opposite aftereffects for male and female voices. The data have already been collected and analyzed. The results motivate the hypothesis for the two follow-up experiments. |

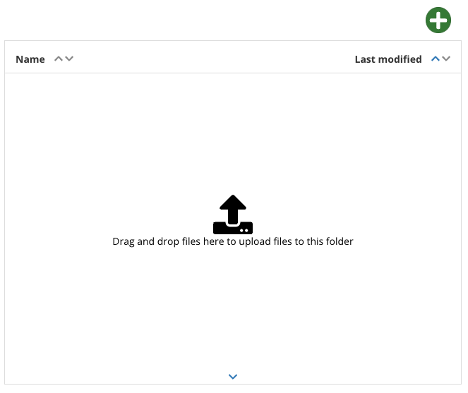
### Data collection procedures\*

Please describe the process by which you will collect your data and your inclusion and exclusion criteria. If you are using human subjects, this should include the population from which you obtain subjects, recruitment efforts, payment for participation, how subjects will be selected for eligibility from the initial pool, and your study timeline. For studies that don't include human subjects, include information about how you will collect samples, duration of data gathering efforts, source or location of samples, or batch numbers you will use.

**Example**: Participants will be recruited through advertisements at local pastry shops. Participants will be paid $10 for agreeing to participate (raised to $30 if our sample size is not reached within 15 days of beginning recruitment). Participants must be at least 18 years old and be able to eat the ingredients of the pastries.

**More information**: The answer to this question requires a specific set of instructions so that another person could repeat the data collection procedures and recreate the study population. Alternatively, if the study population would be unable to be reproduced because it relies on a specific set of circumstances unlikely to be recreated (e.g., a community of people from a specific time and location), the criteria and methods for creating the group and the rationale for this unique set of subjects should be clear.

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| Data will be collected online via the Platform PsyToolkit (Stoet, 2010, Stoet, 2017). Participants will be recruited at the Friedrich Schiller University Jena via mailing lists and through private advertisement by the experimenters. We will aim for at least 30 datasets per experiment that enter analysis. Due to possible exclusion of participants (see below), we will collect data of about 35 - 40 participants per experiment. Data collection of experiments will be done sequentially (first Experiment 2, then Experiment 3). Participants can only participate in one experiment.  Psychology students will be compensated with course credit.  Participants should be between 18 and 50 years old, native German speakers, and without neurological, psychiatric, or hearing impairments. They will be excluded if they report any major technical difficulties, if they reported that they responded randomly, or when they pressed only one key during the whole experiment. |



### Sample size\*

Describe the sample size of your study. How many units will be analyzed in the study? This could be the number of people, birds, classrooms, plots, or countries included. If the units are not individuals, then describe the size requirements for each unit. If you are using a clustered or multilevel design, describe how many units are you collecting at each level of the analysis. This might be the number of samples or a range, minimum, or maximum.

**Example**: Our target sample size is 280 participants. We will attempt to recruit up to 320, assuming that not all will complete the total task.

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| We aim for 38 datasets per experiment. To account for a possible attrition rate, we will test about 40-45 participants per experiment. |

**More information**: For some studies, this will simply be the number of samples or the number of clusters. For others, this could be an expected range, minimum, or maximum number.

### Sample size rationale

This could include a power analysis or an arbitrary constraint such as time, money, or personnel.

**Example**: We used the software program G\*Power to conduct a power analysis. Our goal was to obtain .95 power to detect a medium effect size of .25 at the standard .05 alpha error probability.

**More information**: This gives you an opportunity to specifically state how the sample size will be determined. A wide range of possible answers is acceptable; remember that transparency is more important than principled justifications. If you state any reason for a sample size upfront, it is better than stating no reason and leaving the reader to “fill in the blanks.” Acceptable rationales include: a power analysis, an arbitrary number of subjects, or a number based on time or monetary constraints.

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| An a-priori power analysis using the R-package “Superpower” (Caldwell et al., 2019) for a 2 x 2 within-subject interaction with a medium effect size f = .167, a desired power of .80 and an alpha level of .05 revealed a required sample size of 38. |

### Stopping rule

If your data collection procedures do not give you full control over your exact sample size, specify how you will decide when to terminate your data collection. If you are using sequential analysis, include your pre-specified thresholds.

**Example**: We will post participant sign-up slots by week on the preceding Friday night, with 20 spots posted per week. We will post 20 new slots each week if, on that Friday night, we are below 320 participants.

**More information**: You may specify a stopping rule based on p-values only in the specific case of sequential analyses with pre-specified checkpoints, alphas levels, and stopping rules. Unacceptable rationales include stopping based on p-values if checkpoints and stopping rules are not specified. If you have control over your sample size, then including a stopping rule is not necessary, though it must be clear in this question or a previous question how an exact sample size is attained.

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| Data collection will be stopped with the above mentioned sample size is reached. |

# Variables

In this section you can describe all variables (both manipulated and measured variables) that will later be used in your confirmatory analysis plan. In your analysis plan, you will have the opportunity to describe how each variable will be used. If you have variables which you are measuring for exploratory analyses, you are not required to list them, though you are permitted to do so.

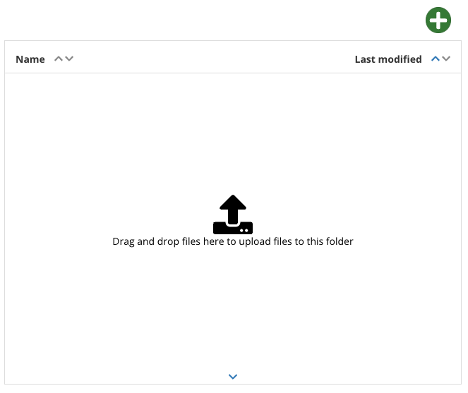
### Manipulated variables

Precisely define all variables you plan to manipulate and the levels or treatment arms of each variable. This is not applicable to any observational study.

**Example:** We manipulated the percentage of sugar by mass added to brownies. The four levels of this categorical variable are: 15%, 20%, 25%, or 40% cane sugar by mass.

**More information**: For any experimental manipulation, you should give a precise definition of each manipulated variable. This must include a precise description of the levels at which each variable will be set, or a specific definition for each categorical treatment. For example, “loud or quiet,” should instead give either a precise decibel level or a means of recreating each level. 'Presence/absence' or 'positive/negative' is an acceptable description if the variable is precisely described.

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| Target voices:   * We manipulated the amount of fearful/angry emotional information via voice morphing   Adaptation conditions:   * We manipulated the adaptation condition in the different adaptation blocks * In Experiment 2, we have the following four blocks:   + Identity 1 – angry / Identity 2 – fearful (all female voices)   + Identity 2 – angry / Identity 1 – fearful (all female voices)   + Identity 3 – angry / Identity 4 – fearful (all male voices)   + Identity 4 – angry / Identity 3 – fearful (all male voices) * In Experiment 3, we have the following four blocks:   + Pseudowords 1,2 – angry / Pseudowords 3,4 – fearful (all female voices)   + Pseudowords 3,4 – angry / Pseudowords 1,2 – fearful (all female voices)   + Pseudowords 1,2 – angry / Pseudowords 3,4 – fearful (all male voices)   + Pseudowords 3,4 – angry / Pseudowords 1,2 – fearful (all male voices)   Further, participants are randomly assigned to one of four possible block orders. |



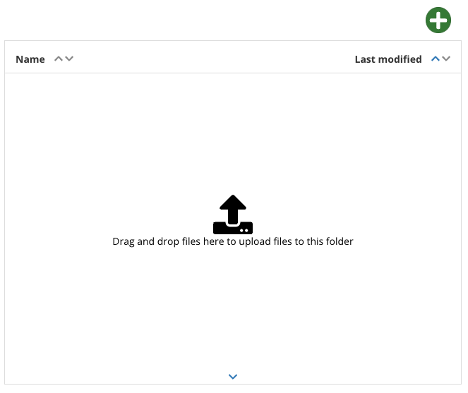
### Measured variables \*

Precisely define each variable that you will measure. This will include outcome measures, as well as any measured predictors or covariates.

**Example**: The single outcome variable will be the perceived tastiness of the single brownie each participant will eat. We will measure this by asking participants ‘How much did you enjoy eating the brownie’ (on a scale of 1-7, 1 being ‘not at all’, 7 being ‘a great deal’) and ‘How good did the brownie taste’ (on a scale of 1-7, 1 being ‘very bad’, 7 being ‘very good’).

**More information**: Observational studies and meta-analyses will include only measured variables. As with the previous questions, the answers here must be precise. For example, 'intelligence,' 'accuracy,' 'aggression,' and 'color' are too vague. Acceptable alternatives could be 'IQ as measured by Wechsler Adult Intelligence Scale' 'percent correct,' 'number of threat displays,' and 'percent reflectance at 400 nm.'

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| In the experiments, we measure the classification of target voices as either fearful or angry (response and reaction time).  As demographic information, we further ask for age, sex, mother tongue, profession and potential hearing impairments.  After the experiment we ask if all voices were played correctly and whether participants experienced any technical difficulties. We also ask them some very general question about how they rate their own voice perception abilities. At the end, participants get the opportunity to enter free-text comments. |



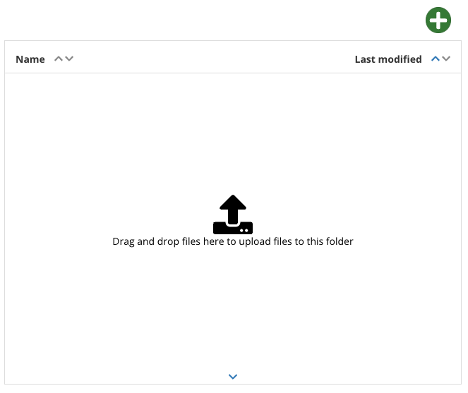
### Indices

If applicable, please define how measures will be combined into an index (or even a mean) and what measures will be used. Include either a formula or a precise description of the method. If you are using a more complicated statistical method to combine measures (e.g. a factor analysis), please note that here but describe the exact method in the analysis plan section.

**Example**: We will take the mean of the two questions above to create a single measure of ‘brownie enjoyment.’

**More information**: If you are using multiple pieces of data to construct a single variable, how will this occur? Both the data that are included and the formula or weights for each measure must be specified. Standard summary statistics, such as “means” do not require a formula, though more complicated indices require either the exact formula or, if it is an established index in the field, the index must be unambiguously defined. For example, “biodiversity index” is too broad, whereas “Shannon’s biodiversity index” is appropriate.

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| Participants responses to the target voices will be modeled using s-shaped cumulative gauss functions. Cumulative gauss function estimate two two parameters: the mean, or the point of subjective equality (PSE) and the standard deviation (SD), which is a direct function of the slope.  The PSE marks the point on the x-axis at which the function crosses 0.5 on the y-axis. Here, this indicates the morph level at which participants were equally likely to give an “angry”- or a “fearful”-response. The PSE is our primary outcome variable, as we expect adaptation to cause a shift in the fitted functions along the x-axis.  We do not except any effect on the SD, but we will explore potential differences nevertheless. |



# Analysis Plan

In this section, you will describe one or more confirmatory analysis. Please remember that all analyses specified below must be reported in the final article, and any additional analyses must be noted as exploratory or hypothesis-generating. A confirmatory analysis plan must state up front which variables are predictors (independent) and which are the outcomes (dependent).

### Statistical models \*

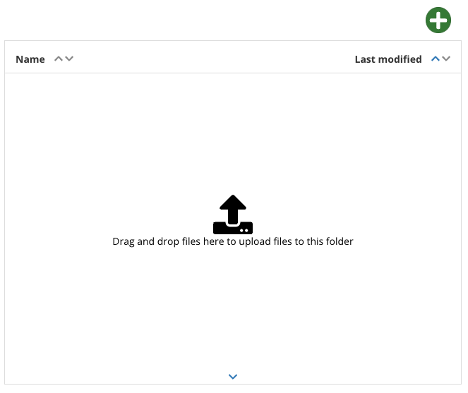
What statistical model will you use to test each hypothesis? Please include the type of model (e.g. ANOVA, RMANOVA, MANOVA, multiple regression, SEM, etc) and the specification of the model. This includes each variable that will be included, all interactions, subgroup analyses, pairwise or complex contrasts, and any follow-up tests from omnibus tests. If you plan on using any positive controls, negative controls, or manipulation checks you may mention that here. Provide enough detail so that another person could run the same analysis with the information provided. Remember that in your final article any test not included here must be noted as exploratory and that you must report the results of all tests.

**Example**: We will use a 2 X 3 repeated measures ANOVA (RMANOVA) with both factors within subjects to analyze our results. This is perhaps the most important and most complicated question within the preregistration. Ask yourself: is enough detail provided to run the same analysis again with the information provided by the user? Be aware for instances where the statistical models appear specific, but actually leave openings for the precise test.

**More information**: This is perhaps the most important and most complicated question within the preregistration. As with all of the other questions, the key is to provide a specific recipe for analyzing the collected data. Ask yourself: is enough detail provided to run the same analysis again with the information provided by the user? Be aware for instances where the statistical models appear specific, but actually leave openings for the precise test. See the following examples:

* If someone specifies a 2x3 ANOVA with both factors within subjects, there is still flexibility with the various types of ANOVAs that could be run. Either a repeated measures ANOVA (RMANOVA) or a multivariate ANOVA (MANOVA) could be used for that design, which are two different tests.
* If you are going to perform a sequential analysis and check after 50, 100, and 150 samples, you must also specify the p-values you’ll test against at those three points.

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| We will run a 2 x 2 within-subject ANOVA on the PSE for female and male voices separately.  For Experiment 2, the factors are:   * adaptation condition * identity   For Experiment 3, the factors are:   * adaptation condition * pseudowords (1,2 vs 3,4) |



### Transformations

If you plan on transforming, centering, recoding the data, or will require a coding scheme for categorical variables, please describe that process.

**Example**: The “Effect of sugar on brownie tastiness” does not require any additional transformations. However, if it were using a regression analysis and each level of sweet had been categorically described (e.g. not sweet, somewhat sweet, sweet, and very sweet), ‘sweet’ could be dummy coded with ‘not sweet’ as the reference category. If any categorical predictors are included in a regression, indicate how those variables will be coded (e.g. dummy coding, summation coding, etc.) and what the reference category will be.

**More information**: If any categorical predictors are included in a regression, indicate how those variables will be coded (e.g. dummy coding, summation coding, etc.) and what the reference category will be.

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| We will fit cumulative gauss function on the raw response data and use the model parameter PSE and the primary outcome variable. For more details, refer to “Indices”. |

### Inference criteria

What criteria will you use to make inferences? Please describe the information you’ll use (e.g. specify the p-values, Bayes factors, specific model fit indices), as well as cut-off criterion, where appropriate. Will you be using one or two tailed tests for each of your analyses? If you are comparing multiple conditions or testing multiple hypotheses, will you account for this?

**Example**: We will use the standard p<.05 criteria for determining if the ANOVA and the post hoc test suggest that the results are significantly different from those expected if the null hypothesis were correct. The post-hoc Tukey-Kramer test adjusts for multiple comparisons.

**More information:** P-values, confidence intervals, and effect sizes are standard means for making an inference, and any level is acceptable, though some criteria must be specified in this or previous fields. Bayesian analyses should specify a Bayes factor or a credible interval. If you are selecting models, then how will you determine the relative quality of each? In regards to multiple comparisons, this is a question with few “wrong” answers. In other words, transparency is more important than any specific method of controlling the false discovery rate or false error rate. One may state an intention to report all tests conducted or one may conduct a specific correction procedure; either strategy is acceptable.

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| We will use the standard p<.05 criteria for determining significant effects. Alongside NHST, we will report effect sizes and confidence intervals.  Post-hoc tests will be corrected for multiple comparisons. |

### Data exclusion

How will you determine what data or samples, if any, to exclude from your analyses? How will outliers be handled? Will you use any awareness check?

**Example**: We will verify that each subject answered each of the three tastiness indices. Outliers will be included in the analysis.

**More information**: Any rule for excluding a particular set of data is acceptable. One may describe rules for excluding a participant or for identifying outlier data.

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| Please refer to the data collection section for inclusion and exclusion criteria of participants.  In exceptional cases, I can be possible that our modelling approach with cumulative gauss functions results in very bad fits for specific conditions in specific participants. In this case, these data will be excluded. But judging from our experience, that happens in very few cases only.  Trials of omission and reaction times < 200 will be excluded prior to fitting the models. |

### Missing data

How will you deal with incomplete or missing data?

**Example**: If a subject does not complete any of the three indices of tastiness, that subject will not be included in the analysis.

**More information**: Any relevant explanation is acceptable. As a final reminder, remember that the final analysis must follow the specified plan, and deviations must be either strongly justified or included as a separate, exploratory analysis.

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| Please refer to the data exclusion section. |

### Exploratory analysis

If you plan to explore your data to look for unspecified differences or relationships, you may include those plans here. If you list an exploratory test here, you are not obligated to report its results. But if you do report it you are obligated to describe it as an exploratory result.

**Example**: We expect that certain demographic traits may be related to taste preferences. Therefore, we will look for relationships between demographic variables (age, gender, income, and marital status) and the primary outcome measures of taste preferences.

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| We will explore the effects of our manipulation on the SD parameter.  We may correlate some of the experimental data with participants demographic information or their responses to the voice-questionnaire. |

# Other

### Other

If there is any additional information that you feel needs to be included in your preregistration, please enter it here. Literature cited, disclosures of any related work such as replications or work that uses the same data, or other context that will be helpful for future readers would be appropriate here.

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| The experiments will be conducted in partial fulfilment of the requirements for a Bachelor degree by Laura Würfel and Johanna Andres.  References:   * Bestelmeyer, P. E. G., Rouger, J., DeBruine, L. M., & Belin, P. (2010a). Auditory adaptation in vocal affect perception. Cognition, 117(2), 217–223. https://doi.org/10.1016/j.cognition.2010.08.008. * Bestelmeyer, P. E. G., Jones, B. C., DeBruine, L. M., & Welling, L. L. M. (2010b). Face aftereffects suggest interdependent processing of expression and sex and of expression and race. Visual Cognition, 18(2), 255–274. https://doi.org/10.1080/13506280802708024. * Caldwell, A., Lakens, D. & Parlett-Pelleriti, C. (2019). Power analysis with Superpower. Self Published on GitHub, https://aaroncaldwell. us/SuperpowerBook. https://scholar.google.de/citations?user=p8vbenoaaaaj&hl=de&oi=sra * Nussbaum, C., von Eiff, C. I., Skuk, V. G., & Schweinberger, S. R. (2022). Vocal emotion adaptation aftereffects within and across speaker genders: Roles of timbre and fundamental frequency. Cognition, 219, 104967. https:// doi. org/ 10. 1016/j. cognition. 2021. 104967 * Stoet, G. (2010). PsyToolkit: A software package for programming psychological experiments using Linux. Behavior Research Methods, 42(4), 1096–1104. https:// doi. org/ 10. 3758/ BRM. 42.4. 1096 * Stoet, G. (2017). PsyToolkit: A novel web-based method for running online questionnaires and reaction-time experiments. Teaching of Psycholog y, 44(1), 24–31. https:// doi. org/ 10. 1177/ 00986 28316 677643 |

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